these conditions be frankly stated to the patient and then if they wish to manage their own lives in the usual erratic way, it is their privilege to do so.

Surgical Treatment.—It is only a question of time in all cases, no matter how ardently you have applied both prophylactic and palliative measures, until an infection occurs and then we are dealing with a pyelitis or nephritis plus stone; or any one of the several conditions mentioned, destructive in their nature to the kidney, or to life, may, and usually do, occur. It is essential therefore that a diagnosis be made before these conditions occur which complicate the surgical treatment and increase the operative mortality.

THE PATHOLOGY AND TREATMENT OF CHRONIC PROSTATITIS

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Our knowledge of chronic prostatitis dates back almost one hundred years, when Lognean in 1815 described chronic inflammation of the prostate as a complication of Gonorrhoea. For a good many years following. however, the prostate received very little attention. The ideas of the medical men of that time regarding affections of the prostate and seminal vesicles were much confused, the distinction betwen chronic prostatitis and chronic vesiculitis not being clearly understood. The first autopsy in which the prostate was carefully examined is supposed to have been performed by Verdier in 1838, and the distinction between the two affections was at least partially cleared up. Since that time we have had many distinguished workers in the prostatic field, among whom may be mentioned Thompson, Finger, Fuller, Guyon, Albarran, Oberlander and Casper. In recent years a great deal of work in this line has been done by Young, of Baltimore, and we are indebted to him for valuable additions to our knowledge of the subject. That chronic prostatitis is a much more common affection than was formerly supposed, is, I think, generally recognised and due no doubt to more exact methods of modern diagnosis. Rothschild in thirty autopsies on men dying from various causes, not referable to the prostate, found twenty-seven with chronic prostatitis and found 90 per cent. of all men examined sufferers from chronic prostatitis, and came to the conclusion that chronic prostatitis often exists when no urethritis is present. In forty-five cases he found no evidence of urethritis in fifteen. Young, Geraghty and Stevens made twenty-one autopsies on cases dying from various causes not referable to the prostate and found chronic prostatitis in fourteen. In nine of these fourteen no urethritis was present. In six of the twenty-one cases, chronic inflammation of the seminal vesicles was present. The percentage of cases of chronic prostatitis that follow the acute form is very hard to determine, and as a very large number are not the result or have anything to do with an acute attack, justifies its consideration as a separate entity. A careful study of the embryology of the prostate greatly elucidates the changes found in chronic prostatitis, as well as giving valuable clews to the treatment. About the third month of foetal life the prostate is represented by a slight thickening surrounding the primitive urethra, close to the vesical orifice and surrounding the lower ends of the Mullerian and Wolfian ducts which later are represented as the prostate utricle and ejaculatory ducts, respectively. This thickening is of mesoblastic tissue and later becomes differentiated, chiefly into involuntary muscle fibers. Shortly after this ring of mesoblastic tissue appears, epithelial buds or outgrowths are noticed growing outward from the primitive urethra, piercing this mesoblastic tissue and by repeated branching forms the glandular parenchyma or secreting structure of the gland. The prostate in foetal life is represented as two distinct lobes which gradually fuse, and during the process of fusion, embrace and enclose the urethra, the Mullerian and Wolfian ducts, but there is a certain distinctness, and to some extent these structures are morphologically separate, a fortunate provision of nature for the prostatic surgeon. The development of the prostate seems to have some connection with the development of the testicles and the sexual nature of the male. In one case I examined; a man of thirty years, the testicles were no larger than an infant's, the prostate was diminutive in size and still retained its primitive form. This patient was able to copulate, but was effeminate in speech and appearance and lacked the characteristics of a normal male. The glandular structure of each primitive lobe is entirely separate and the excretory ducts from the right and left lobe open upon the right and left side of the urethral crest, respectively. A fact that is borne out by a study of many cases of chronic prostatitis in which one side was comparatively healthy and the other was the seat of marked inflammatory lesions. The glandular structure is made up of about thirty distinct tube systems, about fifteen to each lobe. These tube systems are of the tubo-alveolar type and are each drained by a single independent duct. That these tube systems are entirely separate and independent of each other is another .fact easily demonstrated by the frequency with which we find separate discrete nodulation in the gland which represents a tube system in a state of chronic inflammation. Each tube system drains into the prostatic urethra by a long narrow wavy duct, which for the last centimeter of its course is not branched, and therein lies the most potent reason why chronic prostatitis lasts so long and is in many cases so hard to cure and why occlusion of these ducts is attended by so much destruction of the glandular parenchyma.

ETIOLOGY.

The etiology of chronic prostatitis covers a wide range of causes, but may be grouped in two main classes.

First, those cases due primarily to infection of which the gonococcus is, of course, the most common type, but unclean instruments, catheters, etc., also play a very important role. Cases arising during the course of systemic infections are relatively infrequent.

Second, those cases due primarily to chronic congestion of the gland, incident to sexual excess, prolonged ungratified sexual excitement, masturbation, etc. In these latter cases infection with various bacteria is only a matter of time as the congestion lowers the natural resistance and prepares a suitable soil for the development of various organisms. We know that the anterior urethra harbors many bacteria in the normal state, but the posterior urethra is normally free from micro-organisms. The infection probably proceeds from the anterior urethra to the congested posterior urethra and soon finds its way into the prostate. Just what bearing the blood and lymph vessels have as avenues through which infective organisms are carried in these cases, is not entirely clear, but that infection in this way is possible is not doubted. There is one ultimate difference, however, between the Gonococcus cases and the cases due primarily to other causes and that is, the Gonococcus cases last longer, are harder to cure and are characterized by more extensive destruction of the glandular parenchyma, due probably to the more severe grade of inflammation and also to the toxin elaborated by the Gonococcus. Theoretically we might classify chronic prostatitis as catarrhal, follicular, parenchymatous, interstitial, etc., but as such a distinction is not always recognisable clinically, it is not of practical importance. Moreover, we frequently find changes characteristic of all these different phases of inflammation in different parts of the gland at the same time. There are certain cardinal principles in inflammation of the prostate gland which do not differ from inflammation in other structures. We must bear in mind the phenomena associated with the life history and capabilities of the different types of cells, especially as regards their degeneration, regeneration and hyperplasia; being careful to base our ideas and conclusions on established pathological facts in this regard. In the mildest type of cases we find the inflammatory processes involving the terminal excretory ducts at their entrance to the urethra. As these ducts are of small calibre and are not branched during the last centimeter of their course they easily become occluded by desquamated epithelium, leucocytes, etc., and their lumen decreased by the oedema produced by the inflammatory processes in their walls. Following the occlusion of these excretory ducts by the inflammatory process we get a distention of the entire tube system thus drained and from the pressure of the retained secretion and also from the toxins elaborated by the bacteria present, an albuminous degeneration of the secretory epithelium or glandular parenchyma is produced. Sections made from prostates at this stage show a glandular condition of the cytoplasm of the epithelial cells, the nuclei staining poorly or not at all and the cells lacking their clear-cut distinctness. If under favorable circumstances the excretory duct again becomes free and open and the retained products evacuated, the glandular parenchyma may be reproduced providing there remains some epithelial cells that are at least fairly normal. The subject of cell regeneration as far as epithelial structures are concerned, is, I think, pretty definitely settled. Epithelial cells grow only from previously existing and fairly normal cells of the same type. If, however, the inflammatory process has progressed to the point where the glandular parenchyma is entirely destroyed and distinct pathological changes have taken place in the periglandular tissue, characterized by hyperaemia, transmigration of leucocytes, exudation of serum, proliferation of fixed connective tissue cells, etc. In short, the changes typical of exudative inflammation, then repair of the destroyed glandular parenchyma is impossible. A condition of replacement hyperplasia now obtains, marked by disappearance of the normal parenchyma cells, and in their stead a new growth of connective tissue due to proliferation of the fixed connective cells of the part and marked round celled infiltration. Whether the endothelial cells of the capillaries and the so-called "plasma" cells have anything to do with this new growth of connective tissue is not definitely settled. This new growth of connective tissue follows the usual characteristics of such tissue, and as time goes on contracts and shrinks and intercellular fibrillae appear and finally a condition of fibrosis and later sclerosis obtains.

Microscopical sections show in place of acini, and ducts with their beautiful clear-cut epithelial cells and bright staining nuclei, only bands of connective tissue and much round celled infiltration and here and there a dilated acinus, changing and distorting the entire picture. It has been claimed that a glandular hyperplasia is sometimes associated with the connective tissue hyperplasia. I do not believe this to be true. When we examine sections, under the microscope, from a perfectly normal prostate, we frequently see what looks like a glandular hyperplasia, but is really the normal structure of the gland. "The tubules of the gland are normally beset with numerous diverticuli, both simple and compound, that give the canal an irregular lumen and constitute what has been termed the duct alveoli, as distinguished from the terminal alveoli, the latter forming a series of irregularly branched tubular and saccular spaces, lined with a single or imperfectly double layer of columnar epithelial cells" (Piersol). It will be easily seen that a section taken obliquely to the direction of these ducts with the diverticuli, etc., above mentioned might give a picture that would look very much like a glandular hyperplasia. It will be noticed in the normal prostate that the three chief structures are represented about as follows, viz.: Glandular 50 per cent, muscular and connective tissue, of each about 25 per cent. In chronic prostatitis the only structure increased in amount is the connective tissue. That chronic prostatitis stands in a causative relation to either glandular or myomatous hyperplasia, which for want of a better term we call hypertrophy, has not as yet been proven. When we consider the pathological changes found in chronic prostatitis and consider that in many cases, one or many of these tube systems becomes virtually transformed into an abcess cavity which may continue as a suppurating focus for a long time, and later be transformed into a mass of cicatricial tissue, it seems hardly possible that we can expect a complete cure in all our cases, and leads us to believe that the many optimistic reports appearing of late, regarding the administration of Gonococcic vaccine and serum, must have been in cases that were comparatively mild in type and not characterized by any great destruction of the glandular parenchyma.

TREATMENT.

The successful treatment of chronic prostatitis is sometimes one of the most difficult problems confronting the urologist. In addition to the destructive changes that have taken place in the gland, we frequently have the added picture of a nervous, broken down patient, either markedly neurasthenic or hypochrondriacal, two types which should not be confounded, the first based on a distinct pathological foundation, the latter a perverted mentality. It goes without saying that the physician should manifest and actually have a sufficient kindly interest in each patient that will gain his entire confidence.

To succeed with these cases means that we must have the co-operation of the patient, and this we cannot have unless we possess his entire confidence. The treatment resolves itself into general and local treatment. The general treatment should include the adoption of a systematic plan, regulated by the needs of each individual patient to improve his morals as well as his general health. Aside from the regulation of the patient's bowels, which is important, drugs are seldom necessary. The time-honored injunction to give our neurasthenics Iron, Quinine, and Strychnine is already "hoary with age," and mentioned only out of respect. Definite instructions should be given as to sleeping and drinking and eating, avoiding especially excesses in both eating and drinking. These patients should have a plain unstimulating diet, and as far as possible, avoid spiritous and malt liquors. Alcohol and tobacco may not hurt some of these patients, but alcohol especially does none of them any good and some of them a great deal of harm by its pernicious influence on the nervous system. Physical culture and gymnasium practice works wonders for some of these patients, and combined with baths improves the mental, as well as the physical conditions. An occasional Turkish or Russian bath or salt rub is very beneficial. Swimming is an excellent exercise to strengthen the perineal muscles as well as for the benefit of the hydrotherapeusis. In all cases in which there is a loss of diminution of the patient's sexual powers, avoidance of all sexual excitation is imperatively demanded, and the necessity of excluding all sexual thoughts from the mind should be impressed on the patient. There are cases, however, in which the grade of pathological condition is mild, and in which the sexual powers are not interfered with that a moderate indulgence in coitus under normal conditions and in normal amount is really beneficial.

LOCAL TREATMENT.

Abnormal conditions, such as stricture, calculus, chronic urethritis, etc., are of course to be treated either before or concurrent with the chronic prostatitis. The most valuable treatment is massage. I believe with Casper, of Berlin, and Young, of Baltimore, that as regards massage, it is paramount to all other treatment in chronic prostatitis. When I say massage, I do not refer to that procedure known as vibratory masage. In the original Greek the word massage means "to knead," and that is just exactly what I think it should mean, as applied to massage of the prostate.

Everyone who has treated patients who "have been the rounds" of different physicians foi this malady, will agree with me, I think, when I say that there is a wide divergence of opinion in the minds of different medical men as to the modus operandi and utility of this procedure. There are two objects to be accomplished in massage of the prostate. The first one is a thorough emptying of all the pathological products contained in the ducts and acini of the gland. The second is the production of an artificial hyperaemia which stimulates the sluggish circulation in both blood and lymph vessels, which in these cases are always in a state of chronic passive congestion, aiding in the dissolution and absorption of pathological products, restoring tone to the vessel walls and to the muscular structure as well. If the prostate is massaged properly and the first object is successfully accomplished, we can rest assured that the second object will also be obtained.

METHOD.

The first essential is to have the patient in a position in which the prostate is most accessible to the examining finger. This is best accomplished by having the patient stand with his feet slightly separated, his elbows on his knees and his knee joints, not flexed, but having his legs straight at the knees. The operator, seated, can then introduce the right forefinger, covered with a cot, and well lubricated with plain or carbolated vaseline and with the left hand grasp the patient's shoulder. This gives the operator complete control of the situation. The prostate having been carefully mapped out by sweeping the finger over the accessible surface of the gland, noting carefully the size, consistency, tenderness, nodulation, in fact any abnormality present. The seminal vesicles should now be examined by inserting the finger as high as possible, noting also their abnormalities as to size, tenderness, nodulation, etc. In chronic inflammatory conditions we can often feel the lower ends of the vasa deferentia and we frequently find an area of induration at the point where the seminal vesicles join the vasa deferentia, where they sink into the substance of the prostate as the ejaculatory ducts. Of course, in many cases these structure cannot always be felt. But in those in which the original infection has invaded the ejaculatory ducts and traveled up into the seminal vesicles and vasa deferentia and the inflammatory process continued for a long time until distinct pathological conditions have resulted, they are then easily recognisable and must not be overlooked in the process of massage. Massage of these structures is often quite difficult and requires considerable effort on the part of operator, but it is absolutely essential to bring about a cure. After the operator has carefully sized up the situation, which should not be done hurriedly, for fear of missing important details, he now proceeds to massage the prostate in such a maner as will accomplish the first object as noted above, viz: a thorough emptying of all the pathological products contained in the acini and ducts of the gland. In doing this it is well to remember that the integrity of the rectal mucosa is to be carefully preserved and must not be rubbed or otherwise injured by the massaging finger. In place of sliding the finger over the rectal mucosa, it should as far as possible move with the finger. Starting our manipulation at the median line gradually work outward and up toward the seminal vesicles on each side. The time to be consumed should not be longer than is consistent with thoroughness, but will require several minutes.

When we consider that the true capsule of the prostate is quite tough, and besides that the prostate is invested by a very strong fascia which is reflected from the pelvic fascia along the arcus tendineus, called the fascia endopelvina, sometimes called the fascia of Denonvilliers, and considering the nature of all the structures with which we have to deal, we can hardly expect to accomplish much without real actual pressure. Following the massage a copius urethro-vesical irrigation is absolutely necessary, and under no circumstances to be omitted. Unless this is followed out we will sometimes find that bacteria that have lain dormant in the prostate will set up urethritis and often cystitis or bacteriuria. The fluid used for irrigation may be either warm, sterile, normal salt solution, potassium permanganate 1 to 6000, or hg. bichlor. 1 to 60,000 or silver nitrate, 1 to 10,000. In making up these solutions it is absolutely necessary to use sterile water, not tap water, sterile irrigators and tips that are boiled for each patient. The interval between the treatments is a matter of some importance. No rule is applicable to all cases, but twice a week is a general average. Overtreatment is to be avoided for its unfavorable effect of causing too much irritation as well as directing the patient's mind too much to his trouble. In many cases once a week is sufficient, and produces very satisfactory results. Dilatation of the posterior urethra once a week, or at least not oftener than once in four or five days, with a Kohlman dilator, or a large sound, is very beneficial in reducing the hypersensibility of the urethra, as well as assisting in the absorption of the sub-mucous infiltration and the infiltration around the terminal excretory ducts, and does for the urethra what massage does for the prostate. The degree of dilatation should be suited to each case, and varies between 30 and 40 F. Excessive dilatation carried on too long is harmful and should be avoided. I seldom dilate over 35 F. Hot rectal irrigations are sometimes of value, and not to be overlooked, but it is not always easy to get patients to carry out this procedure sufficiently to produce tangible results. As to the injection of gonococcic vaccine and serum, the optimistic reports of some writers have been more than counterbalanced by the adverse reports of others. Personally I have seen no permanent benefit from vaccine and serum in chronic prostatitis. There are several obstacles in the way of serum and vaccine therapy in this disease. In the first place it is necessary to have the serum or vaccine that represents the offending organism. Several years ago Porosz emphasized the infrequency of the gonococcus in chronic prostatitis. Notthaft states that Neisler, Putzler, Finger, and Walsh accept the persistence of the gonococcus in the prostate for one year. Other writers (Schram, Judassohn, Ruggles, and Goldberg) attach great significance to mixed and secondary infections. Notthaft, in a study of 120 cases of chronic prostatitis, found the gonococcus in only 9.5 per cent. of cases that appeared within one year of the last gonorrhœal infection, and in no case at the end of the third year. As remarked before, the posterior urethra, in normal conditions, is free from bacteria, but in pathologic conditions many bacteria may be found. Tano found in the shreds of 30 cases of chronic posterior urethritis, 29 varieties of bacteria. However, bacteria in the posterior urethra do not necessarily invade the prostate, and for this reason the technique of the methods employed in the determination of the bacteriology of chronic prostatitis is a matter of scientific importance. Young, Geraghty, and Stevens, in a very careful bacteriological research of chronic prostatitis, in which precaution was taken to not have the prostatic secretion contaminated by any bacteria in the urethra, found in 17 patients no gonococci at all and in only 6 of the 17 cases any other bacteria. One of the 6 positive cases had never had gonorrhea. The other 5 cases had their last gonorrhœal infection from four months to 15 years prior to the examination. The bacteria found in these 6 positive cases were the staphylococcus albus, streptococcus pyogenes, and a bacillus (not identified). From the foregoing it will be seen that the presence of the gonococcus in chronic prostatitis after the first year is, in the majority of cases, unlikely. Even if the gonococcus is present, the question of autogenous and stock vaccines confronts us. And if the gonococcus is absent we can hardly expect gonoccic vaccine or serum to benefit those cases of secondary infection in which the identity of the organisms present is so hard to determine.

CONCLUSIONS.

1. Chronic prostatitis is a more common affection than is generally supposed.
2. That manual massage with the finger, carefully and thoroughly performed, is the most valuable measure in the treatment.
3. That accompanying the massage, the "toilet" of the urethra and bladder is just as important as in a surgical operation.
4. That gonococcic vaccine and serum offers very little assistance in the therapy.

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